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| 10/565,152 | 01/19/2006 | Mark E. McNie | 124-1146 | 8102 |
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| NIXON & VANDERHYE, PC | | | SMITH, CHAD | |
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| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| | | |
|------------------------------|-----------------|--------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 10/565,152 | MCNIE ET AL. |
| | Examiner | Art Unit |
| | Chad H. Smith | 2874 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 19 January 2006.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-43 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-43 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 19 January 2006 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. 10565152.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>1/19/2006</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1 – 10, 14 – 16, 18 – 22, 33 – 43 are rejected under 35 U.S.C. 102(e) as being anticipated by Jenkins et al. (WO 03/065091 A2, using U.S. PG Pub. # 2005/0089262 A1 by reference).
2. Regarding claim 1, Jenkins et al. teaches a transmitter apparatus comprising one or more lasers (par. 0010), modulation means (par. 0010) to intensity modulate radiation output by each of said one or more lasers, and output means (par. 0135) for outputting the modulated radiation produced by the modulation means characterised in that the apparatus comprises hollow core optical waveguides formed in a substrate (par. 0007) which, in use, guide radiation from the one or more lasers to the modulation means and from the modulation means to the output means.
3. As stated in MPEP §2114, “[w]hile features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function.” *In re Schreiber*, 128 F.3d 1473, 1477-78, 44

USPQ2d 1429, 1431-32 (Fed. Cir. 1997). A claim containing “a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). As such, while the functional language limitations are not ignored, such limitations are not given patentable weight, and the claimed limitations are anticipated if a prior art apparatus is capable of performing the claimed function. MPEP §2114. Claim 1 contains functional limitations (...to intensity modulate radiation output by each of said one or more lasers... and ...for outputting the modulated radiation produced by the modulation means...). Since the disclosed apparatus of Jenkins et al. is fully capable of performing the recited function, and contains all recited structural elements, the claim rejection based on Jenkins et al. is proper.

4. In addition, it is respectfully noted that it would be improper to import specific structural limitations (which are not actually claimed and recited in the claims) from the specification into the claims when interpreting functional language limitations. See MPEP §2111. Thus, the pending claims will be given their broadest reasonable interpretation consistent with the specification, without importing limitations from the specification into the claims.

5. Regarding claim 2, Jenkins et al. teaches wherein at least one of the one or more lasers and the modulation means is a discrete component (par. 0100).

6. Regarding claim 3, Jenkins et al. teaches wherein said discrete component is located in an alignment slot formed in the substrate (par. 0100).

7. Regarding claim 4, Jenkins et al. teaches wherein at least one of the one or more lasers and the modulation means is a monolithic component formed in the substrate (par. 0018).

8. Regarding claim 5, Jenkins et al. teaches wherein the output means (236) is arranged to couple the modulated radiation into at least one output optical fibre (par. 0135).

9. Regarding claim 6, Jenkins et al. teaches wherein the output means comprises at least one fibre attachment means (pars. 0010, 0012, 0137).

10. Regarding claim 7, Jenkins et al. teaches wherein at least one optical fibre attachment means is arranged to receive a lensed output optical fibre (par. 0051).

11. Regarding claim 8, Jenkins et al. teaches wherein at least one optical fibre attachment means comprises a mode matching means (par. 0050).

12. Regarding claim 9, Jenkins et al. teaches comprising one laser (par. 0100).

13. Regarding claim 10, Jenkins et al. teaches comprising a plurality of lasers (optical component) (par. 0091, lines 2 – 3, par. 0100).

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14. Regarding claim 14, Jenkins et al. teaches wherein one of said one or more lasers is a semiconductor laser (par. 0018).

15. Regarding claim 15, Jenkins et al. teaches wherein said semiconductor laser is a wavelength tuneable semiconductor laser (par. 0018).

16. Regarding claim 16, Jenkins et al. teaches wherein one or more detectors are provided to monitor the intensity of radiation output by said one or more lasers (par. 0010).

As stated in MPEP §2114, “[w]hile features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function.” *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997). A claim containing “a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim.

Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). As such, while the functional language limitations are not ignored, such limitations are not given patentable weight, and the claimed limitations are anticipated if a prior art apparatus is capable of performing the claimed function. MPEP §2114. Claim 16 contains a functional limitation (...to monitor the intensity of radiation output ...). Since the disclosed apparatus of Jenkins et al. is fully capable of performing the recited function, and contains all recited structural elements, the claim rejection based on Jenkins et al. is proper.

17. In addition, it is respectfully noted that it would be improper to import specific structural limitations (which are not actually claimed and recited in the claims) from the specification into the claims when interpreting functional language limitations. See MPEP §2111. Thus, the pending claims will be given their broadest reasonable interpretation consistent with the specification, without importing limitations from the specification into the claims.

18. Regarding claim 18, Jenkins et al. teaches wherein one or more beam shaping means are provided (par. 0132).

19. Regarding claim 19, Jenkins et al. teaches wherein at least one of said beam shaping means comprise one or more lenses (par. 0132).

20. Regarding claim 20, Jenkins et al. teaches wherein at least one of said beam shaping means comprises a tapered hollow core optical waveguide (par. 0140).

21. Regarding claim 21, Jenkins et al. teaches wherein said modulation means comprises one or more electro-optic modulators (par. 0020).

22. Regarding claim 22, Jenkins et al. teaches a transmitter apparatus comprising at least one laser (par. 0010) capable of producing intensity modulated radiation and output means (par. 0135) for coupling the radiation produced by the laser into at least one output optical fibre characterised in that the apparatus comprises hollow core optical waveguides formed in a

substrate which, in use, guide radiation from the at least one laser to the at least one optical fibre (par. 0135).

23. Regarding claim 33, Jenkins et al. teaches an transmit/receive apparatus comprising transmitter apparatus as claimed in claim 1 and receiver apparatus (par. 0010).

24. Regarding claim 34, Jenkins et al. teaches wherein said transmitter apparatus and said receiver apparatus are formed on a common substrate (pars. 0010, 0018).

25. Regarding claim 35, Jenkins et al. teaches wherein the substrate comprises semiconductor material (par. 0018).

26. Regarding claim 36, Jenkins et al. teaches wherein the substrate comprises a silicon on insulator (SOI) wafer (par. 0011).

27. Regarding claim 37, Jenkins et al. teaches formed by micro-fabrication techniques (par. 0011).

28. Regarding claim 38, Jenkins et al. teaches wherein the micro-fabrication technique includes deep reactive ion etching (par. 0047).

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29. Regarding claim 39, Jenkins et al. teaches wherein the hollow core optical waveguides are of substantially rectangular cross section (par. 0040).

30. Regarding claim 40, Jenkins et al. teaches wherein the hollow core optical waveguides are dimensioned to preferably guide radiation propagating in the fundamental mode (par. 0098).

31. Regarding claim 41, Jenkins et al. teaches wherein the hollow core optical waveguides are dimensioned to preferably guide radiation propagating in multiple optical modes (par. 0098).

32. Regarding claim 42, Jenkins et al. teaches wherein the internal surfaces of the hollow core optical waveguides carry a reflective coating (par. 0033).

33. Regarding claim 43, Jenkins et al. teaches wherein the substrate comprises a base portion and a lid portion (par. 0096).

34. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

35. Claims 23, 24, 27, 28 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Krippner et al. (“Microspectrometer System for the Near Infrared Wavelength Range based on the LIGA Technology”, Proceedings of SPIE Vol. 3912 (2000), pgs. 141 – 149).

36. Regarding claim 23, Krippner et al. teaches a receiver apparatus comprising one or more detectors (abstract pg. 141) and one or more optical fibre attachment means (Optical layer, line 6, fig. 2), the one or more optical fibre attachment means being arranged to receive one or more one optical fibres (fig. 2), characterised in that radiation is guided from the one or more optical fibres to the one or more detectors by at least one hollow core optical waveguide formed in a substrate (abstract, page 143, fig. 2).

37. Regarding claim 24, Krippner et al. teaches a plurality of detectors (abstract, page. 142, par. 4, line 1).

38. Regarding claim 27, Krippner et al. teaches wherein one optical fibre attachment means is provided, said optical fibre attachment means being arranged to receive one optical fibre carrying radiation comprising a plurality of different wavelength channels (abstract, page. 143).

39. Regarding claim 28, Krippner et al. teaches wavelength demultiplexing means, said wavelength demultiplexing means (grating) being arranged to separate said different wavelength channels and to direct each wavelength channel to one of the plurality of detectors (pg. 143).

40. Regarding claim 30, Krippner et al. teaches at least one wavelength selective filter (pg. 147, par. 3).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

41. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jenkins et al. (WO 03/065091 A2, using U.S. PG Pub. # 2005/0089262 A1 by reference) in view of Jenkins et al. ("A Hollow Waveguide Integrated Optic Subsystem for a 10.6µm Range-Doppler Imaging Lidar", Proceedings of SPIE, Vol. 4034 (2000), pgs. 108 – 113).

42. The cited primary reference teaches the basic claimed apparatus of claim 10 as discussed above.

43. The cited primary reference does not teach wherein each of said plurality of lasers have a different output wavelength.

44. The added secondary reference teaches two laser sources one mode locked and one continuous wave for mixing in a waveguide to create a reference signal for Doppler imaging (pg. 109, par. 2, lines 2 – 4).

45. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Jenkins et al.'s ('065091') transmitter apparatus with Jenkins et al.'s (Proceedings of SPIE) teaching of teaches two laser sources one mode locked and one continuous wave for mixing in a waveguide to create a reference signal for Doppler imaging and integrate these lasers into a substrate with the other optical components.

46. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jenkins et al. ("A Hollow Waveguide Integrated Optic Subsystem for a 10.6 μ m Range-Doppler Imaging Lidar", Proceedings of SPIE, Vol. 4034 (2000), pgs. 108 – 113) in view of Jenkins et al. (WO 03/065091 A2, using U.S. PG Pub. # 2005/0089262 A1 by reference).

47. The primary reference teaches wherein beam combining means are additionally provided to combine the plurality of modulated beams into a combined beam wherein said output means is arranged to couple the combined beam (fig. 2, pg. 109, par. 2)

48. The cited primary reference does not teach coupling the combined beam into an output fiber.

49. The added secondary reference teaches the claimed apparatus of claim 11 as discussed above and an optical fiber used to couple light from the photonic light circuit as fiber allows for the light path the bend to a desired position (par. 0010).

50. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Jenkins et al.'s (Proceedings of SPIE) beam combining means with Jenkins et al.'s ('065091') teaching of an optical fiber for coupling light out of the photonic light circuit as fiber allows for the light path the bend to a desired position.

51. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jenkins et al. (WO 03/065091 A2, using U.S. PG Pub. # 2005/0089262 A1 by reference).

52. The cited primary reference teaches the basic claimed apparatus of claim 10 and teaches waveguide configurations wherein the waveguide is able to branch the signals to multiple optical fibers (par. 00135). Furthermore, the cited primary reference teaches an MMI device for optical routing capabilities (par. 0142 – 0143).

53. The cited primary reference does not teach the output means connected to the MMI device.

54. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the teaching of the MMI structure with the output means to connect the output optical fibers for coupling to the MMI structure.

55. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jenkins et al. (WO 03/065091 A2, using U.S. PG Pub. # 2005/0089262 A1 by reference) in view of Murphy et al. (WO 99/42879).

56. The cited primary reference teaches the basic claimed transmitter apparatus of claim 1 as discussed above.

57. The cited primary reference does not teach at least one optical isolator.

58. The added secondary reference teaches an optical isolator for shielding the laser from reflected light (pg. 7, lines 31 – 32).

59. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Jenkins et al.'s transmitter apparatus with the teachings of Murphy et al.'s optical isolator for shielding the laser from reflected light.

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60. Regarding claim 25, Krippner et al. ("Microspectrometer System for the Near Infrared Wavelength Range based on the LIGA Technology", Proceedings of SPIE Vol. 3912 (2000), pgs. 141 – 149) discloses the claimed invention except for wherein a plurality of optical fibre attachment means are provided to receive a plurality of optical fibres. It would have been obvious to one having ordinary skill in the art at the time the invention was made to add more optical fibers for more signals to be passed through and guided into the hollow core optical waveguide, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

61. Regarding claim 26, the case law above recites the duplication of the optical fibers for Krippner et al.'s teachings, however since claim 25 teaches a plurality of optical fibres attached to a plurality of optical fibre attachments it can be seen that these fibres in fig. 2 (pg. 143) would transmit radiation that is broken up into wavelengths by the grating and transmitted to the detectors. Therefore, if multiple fibres are inputting radiation into the spectrometer of Krippner et al. the radiation from each fibre will be separated into wavelengths and sent to a detector and it is obvious that multiple fibers will have their radiation impinging on a common detector after being incident on the grating.

62. Claims 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Krippner et al. ("Microspectrometer System for the Near Infrared Wavelength Range based on the LIGA Technology", Proceedings of SPIE Vol. 3912 (2000), pgs. 141 – 149) in view of Jenkins et al.

(“A Hollow Waveguide Integrated Optic Subsystem for a 10.6 μ m Range-Doppler Imaging Lidar”, Proceedings of SPIE, Vol. 4034 (2000), pgs. 108 – 113).

63. The cited primary reference teaches the basic claimed receiver apparatus of claim 23 as discussed above.

64. The cited primary reference does not teach at least one variable optical attenuator arranged to provide controllable attenuation of the radiation received from said at least one optical fibre.

65. The added secondary reference teaches a half wave plate and a thin film polarizer used to adjust the magnitude of an “s” polarized beam that can be utilized to adjust the intensity of light reaching the detector so as not to destroy the detector (pg. 109, pars. 2 – 3).

66. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Krippner et al.’s receiver apparatus with Jenkins et al.’s teaching of a thin film polarizer used to adjust the magnitude of an “s” polarized beam that can be utilized to adjust the intensity of light reaching the detector so as not to destroy the detector.

67. Claims 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krippner et al. (“Microspectrometer System for the Near Infrared Wavelength Range based on

the LIGA Technology", Proceedings of SPIE Vol. 3912 (2000), pgs. 141 – 149) in view of Jenkins et al. (U.S. PG Pub. # 2005/0089262 A1).

68. The cited primary reference teaches the basic claimed receiver apparatus of claim 23 as discussed above.

69. The cited primary reference does not teach wherein at least one optical fibre attachment means comprises a mode matching means.

70. The added secondary reference teaches wherein at least one optical fibre attachment means comprises a mode matching means so as to keep the optical spectrum intact (par. 0050).

71. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Krippner et al.'s receiver apparatus with Jenkins et al.'s teaching of an optical fibre attachment means comprises a mode matching means so as to keep the optical spectrum intact.

72. Regarding claim 32, Jenkins et al. teaches a lensed optical fiber for coupling of modes between a hollow waveguide and an optical fiber (pars. 0050, 0051).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chad H. Smith whose telephone number is (571) 270-1294. The examiner can normally be reached on Monday-Thursday 7:30a.m. - 5:00p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on 571-270-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CHS



SUNG PAK
PRIMARY EXAMINER